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Parasites Important to Poultry in Hawai'i and Their Control

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Hawai'i is home both to a commercial poultry industry and to many small rural homesteads that raise chickens for subsistence, hobby, show, or simply for pleasure. The owners of many of these smaller farm flocks have often adopted a free-range type of management. The free-range management is certainly an acceptable type of husbandry practice, but there are some special health considerations to keep in mind, especially in the area of parasite control. Free-ranging birds have an increased opportunity to encounter the infective eggs, larvae, and intermediate hosts of parasites that can cause serious debilitating infections.

Healthy birds are a prerequisite for success in raising poultry, regardless of the overall goals of the owner. Unhealthy birds result in financial losses in terms of death and treatment costs. It is well documented that diseases and parasites are the cause for millions of dollars of losses to poultry producers each year. Death losses are an obvious loss, but even greater economic losses are associated with decreased growth, egg production, and feed efficiency among the living. Parasites are an important cause of this hidden economic loss. Not all poultry losses can be prevented, but they can be reduced, and the more knowledgeable the producers, the more successful they will be.

Prevention and control of parasites is one of the quickest, cheapest, and most dependable methods of increasing production, with no requirements for extra birds or additional feed costs. Only a small increase in labor and materials is required.

Important parasites of poultry in Hawai'i

The most common and economically important internal poultry parasites in Hawai'i include the large roundworm (*Ascarida galli*), the gapeworm (*Syngamus trachea*), tapeworms (*Davainea proglottina* and *Raillietina* spp.) and coccidiosis (*Eimeria* sp.) The common red mite, or the roost mite (Dermanyssus gallinae), is an important external parasite that can cause great economic loss if not controlled.

The large roundworm (*Ascarida galli*) is about 1½–3 inches long and lives in the intestines of the bird. Symptoms of infection with this parasite include poor flesh, unthriftiness, weakness, reduced egg production, weight loss, and pale head and legs. Parasite eggs are passed in the feces and develop to an infective stage in about 10–20 days. Parasite eggs are then ingested by another chicken, and the larval or baby worms hatch in the host's intestine and grow to maturity in 6–8 weeks. The common earthworm can serve as a transport host. Good management and husbandry is important to control this parasite. Young birds should be separated from older birds, yards and pens should be rotated and cleaned, and deep-litter pens must be kept dry. Droppings should be removed frequently. Several wormers, including thiabendazole, fenbendazole, cambendazole, pyrantel, mebendazole, and levamisole, are effective in killing

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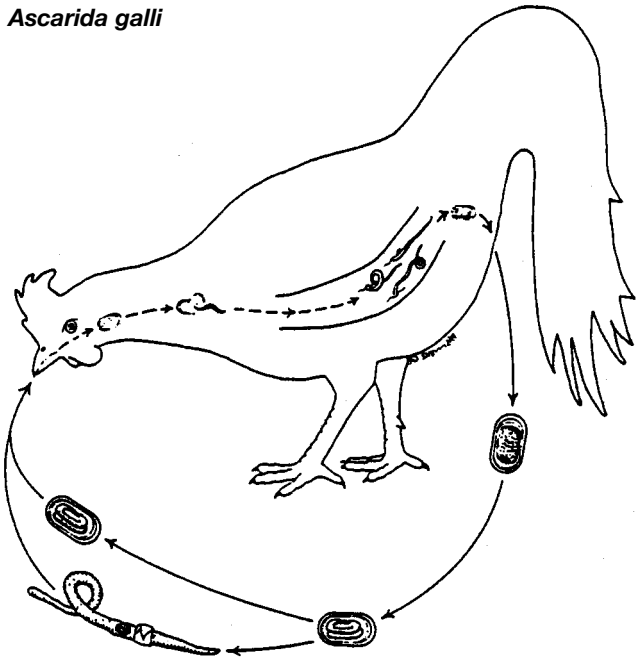
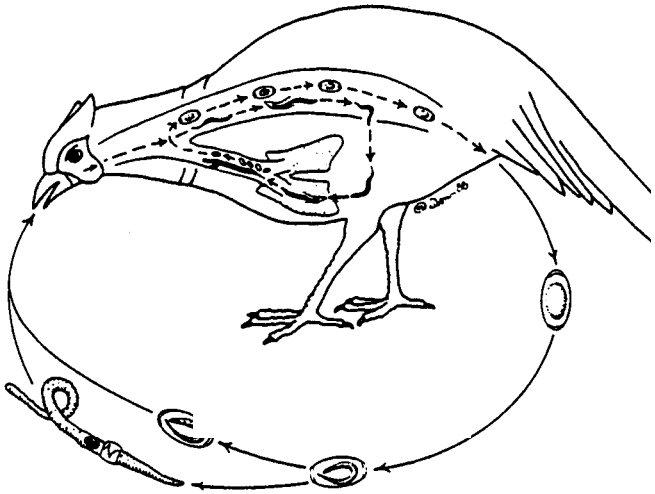
Ascarida galli



Syngamus trachea



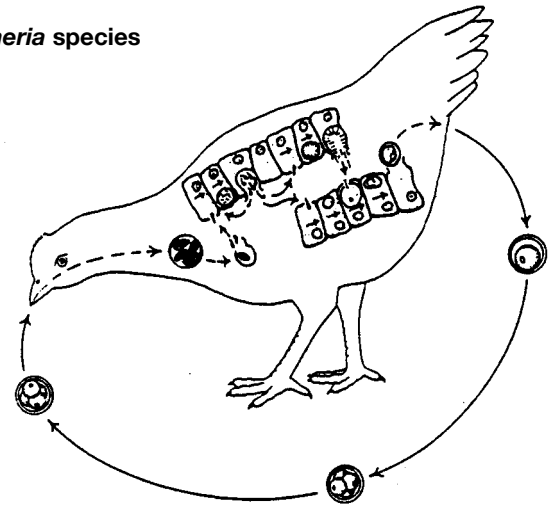
this parasite. See Table 1.

The gapeworm (*Syngamus trachea*) lives in the trachea, or windpipe of chickens. Adult worms are red and range in length from 3 to 8 inches. Young birds are the most seriously affected. Infected birds crouch, extend their necks, and gasp for breath because of mechanical obstruction of the trachea by adult worms. There is usually a mucus excretion and convulsive head shaking. Death may result from asphyxia or progressive emaciation and weakness. Birds become infected directly by ingestion of embryonated eggs or by the ingestion of earthworms containing free or encysted gapeworm larvae. Gapeworm larvae may remain infective in the earthworm for over 4 years. Passage through earthworms is thought to render larvae more highly infective, enabling strains to transfer more readily from one bird species to another. After ingestion, the larvae travel via the blood to the lungs and migrate via the air passages to the trachea. The prepatent period is 2–3 weeks and the adults live 4–8 months. Control of this parasite is by avoiding pens and yards with wet, organic soils with large numbers of earthworms. Place birds on fresh ground; contact with wild birds should be controlled. The drugs used to control the large roundworm will also have efficacy against the gapeworm.

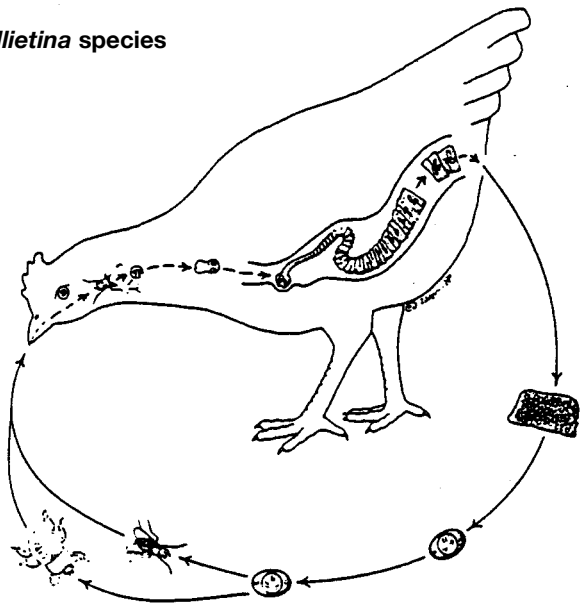
Several species of tapeworms infect chickens. The two most common in Hawai'i are the minute tapeworm (*Davainea proglottina*) and the broad-headed tapeworm (*Raillietina cesticellus*). Both species of adult tapeworm live in the intestines of the birds. The segments of the minute tapeworm pass out in the feces, and eggs contained in the segments hatch after being swallowed by any of several species of slug, which serve as the intermediate host. Within the slug, the tapeworm develops to an intermediate stage called a cysticercoid in about 3 weeks. When the slugs containing the tapeworm are eaten by a chicken, the intermediate tapeworm stage is released and develops to an adult in about 2 weeks. The intermediate hosts for the broad-headed tapeworm are many species of beetles or the housefly. The minute tapeworm is considered to be highly pathogenic. Infected birds show marked weight loss, general debility, unthriftiness, and stunted growth. Egg-laying may stop. Birds on range are more liable to become infected than those in pens and dry yards. Slug, fly, and beetle control is necessary. Infected birds can be treated with niclosamide (Yomesan® in the food) or mebendazole to kill adult worms.

Coccidiosis disease of poultry is caused by a single-celled protozoan parasite (*Eimeria* sp.). Disease is most frequently seen in young birds 4–6 weeks of age. Depending on the size of the bird, the immune status and the infective dose, signs of infection can range from no apparent signs to death. It is frequently an acute disease with bloody droppings. Birds are ruffled, sleepy, and unthrifty. A severe anemia may occur because of blood loss. Droppings of infected birds transmit the disease.

***Eimeria* species**

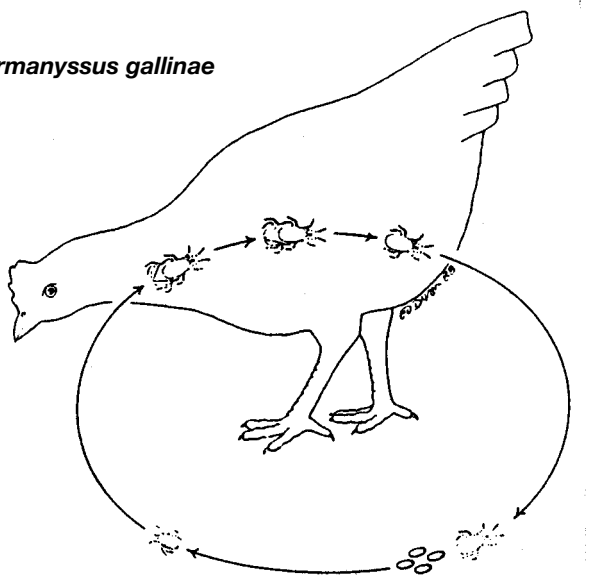


***Raillietina* species**



The coccidia eggs (or oocysts) can persist in the environment for a long time, especially in warm moist climates such as Hawai'i . Good management, such as raising young birds apart from older birds, keeping litter dry, cleaning feeders and waterers weekly, and sanitation, is required to prevent and control this disease. Many anti-coccidias are effective in preventing infections but have little value in treatment. For treatment, the most commonly used drugs are the sulfonamides and amprolium. These drugs can be given in the feed or water. Use of reventive measures, without complete reliance on drugs, is the most prudent program to follow.

Dermanyssus gallinae



The common red mite or roost mite (*Dermanyssus gallinae*) is an important external parasite of chickens, wild birds, and occasionally man. The mite breeds in the bird's environment and attacks its host at night. After a blood meal, the adult mite is red, about 1 mm long, and in large numbers they are sometimes described as "moving paprika." The eggs of the mite are usually laid after a blood meal and are deposited in cracks and crevices in the walls of the poultry house or in the nest boxes. Eggs hatch in 2–3 days, and the life cycle may be completed in 7–9 days under optimal conditions. Adults may survive 4–5 months without feeding. Mites are spread by direct contact with infested birds or contaminated equipment and poultry litter. Infested birds are frequently uneasy and do not rest well at night. Birds in production may refuse to lay in infested nests. Decreased egg production, anemia, paleness, droopiness, and death are signs of infection. Because this mite is generally off the host during the day, cleaning of equipment, cages, and bird's quarters is more important than treating individual birds. Contact with wild birds such as sparrows should be prevented. Sevin® (carbaryl) controls this mite and should be applied every 2–3 weeks. Dusts and sprays of malathion are also effective.

A program of health, disease prevention, and parasite control

Preventing disease is much more economical than treating a disease outbreak. Although the exact program will vary according to the specific conditions on each individual farm, the basic principles are the same.

1. Get clean stock. Clean stock simplifies the problem of disease control by reducing the number and severity of problems that are present when the flock is established. Purchase stock from breeders who participate in organized disease control programs.

2. Avoid bringing infection in. Quarantine newly acquired birds and watch for any signs of disease. Keep out unnecessary visitors and equipment.

3. Follow a vaccination program. Vaccination is cheap insurance against losses from certain diseases.

4. Control internal and external parasites and reduce stresses. Feed is too costly to feed to parasites. Controlling parasites helps maintain birds in good condition so that they can resist disease organisms.

5. Recognize disease early. A good caretaker should set aside a time each day for the purpose of observing the flock. Note changes in birds' actions, eating and drinking, and unusual sounds like sneezing or rattling. Good recordkeeping helps recognize the early stages of trouble by showing slumps in feed and water consumption, egg production, and mortality.

6. Use a veterinarian and a diagnostic laboratory. A veterinarian and a diagnostic laboratory can assist in making the right treatment choices. thereby avoiding heavy losses if the wrong medication is given.

7. Dispose of carcasses properly. Sanitary disposal of dead birds is essential for the control of disease, flies, and odors.

8. Periodically vacate and clean. All poultry buildings should periodically be vacated, thoroughly cleaned. and disinfected. This is an effective way to prevent the development of disease cycles.

References

Calnek, B.W. 1991. Diseases of poultry. Iowa State Univ. Press, Ames, Iowa. 929 p.

Foreyt, W.,J. 1990. Veterinary parasitology reference manual. Washington State Univ., Pullman, Washington. p. 141–153.

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Drawings of life cycles reproduced with permission from Dr. W.J. Foreyt.

Table 1. Important parasites of poultry in Hawai'i, the common symptoms of infection, and products for treatment.

Parasite	*Symptoms*	*Treatment*
Large roundworm (*Ascarida galli*)	Poor weight gains, pale head and legs	Thiabendazole (TBZ®, 500 mg/lb) Fenbendazole (Panacur®, Safe-Guard® 30 mg/lb/day, 3days) Pyrantel (Strongid-T®, 50 mg/lb) Mebendazole (TelminB®, 20 mg/lb/day, 3 days) Levamisole (Levasole®, Tramisol®, 10–20 mg/lb) Piperazine (Piperazine-17%®, 1 oz/gal water/l00 birds <6 wks age)
Gapeworm (*Syngamus trachea*)	Gasping, head shaking, unthriftiness, death	As for large roundworm, above
Tapeworms (*Davainea proglottina* and *Raillietina* spp.)	Poor flesh, unthriftiness, stunted growth	Niclosamide (Yomesan®, 25 mg/lb) Mebendazole (TelminB®, 20 mg/lb/day for 3 days)
Coccidiosis (*Eimeria* sp.)	Unthriftiness, ruffled, sleepy, bloody droppings	Sulfonamides, 25 mg/lb/day as needed Amprolium in water, 0.12–0.24%/day for 3–5 days
Red mite or roost mite (*Dermanyssus gallinae*)	Droopy, pale, listless	Treat host and environment for 3 days (Coumaphos, 0.5% dust; Malathion, 4%, dust)

NOTE: Piperazine is the only drug listed here approved for use in poultry. The others have been mentioned in the literature as being useful. Use of these products is recommended only under the supervision of a licensed veterinarian.